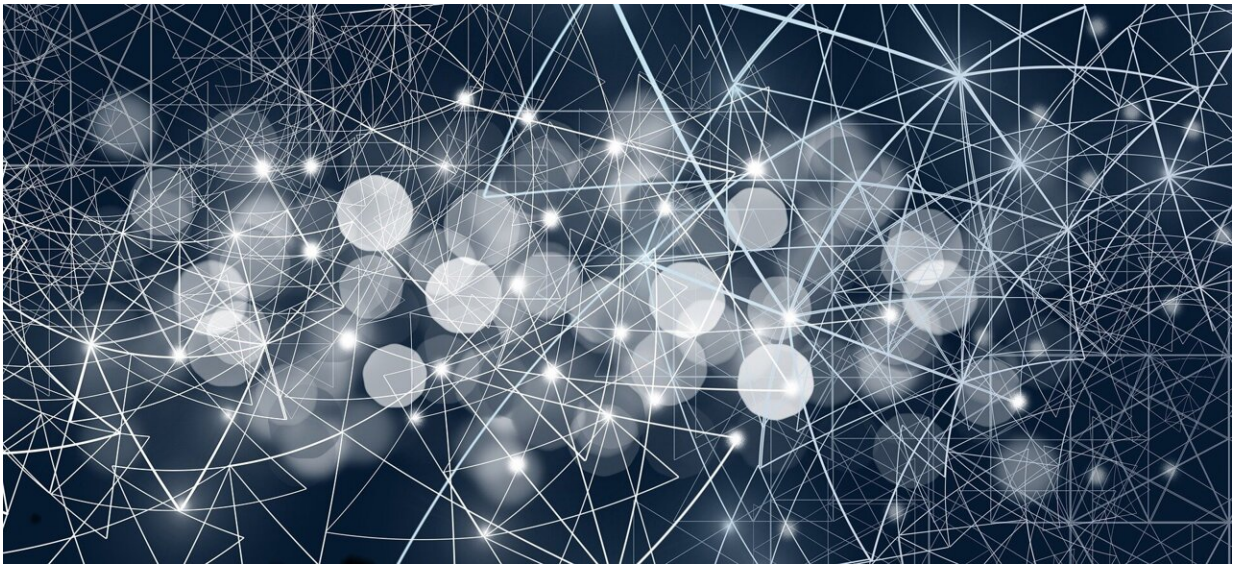


Students use machine learning in lesson designed to reveal issues, promise of AI

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In a new study, North Carolina State University researchers had 28 high school students create their own machine learning artificial intelligence (AI) models for analyzing data. The goals of the project were to help students explore the challenges, limitations and promise of AI, and to ensure a future workforce is prepared to make use of AI tools.

The work is published in the journal *Learning, Media and Technology*.

The study was conducted in conjunction with a [high school](#) journalism class in the Northeast. Since then, researchers have expanded the program to high [school](#) classrooms in multiple states, including North Carolina. NC State researchers are looking to partner with additional schools to collaborate in bringing the curriculum into classrooms.

"We want [students](#), from a very young age, to open up that black box so they aren't afraid of AI," said the study's lead author Shiyang Jiang, assistant professor of learning design and technology at NC State. "We want students to know the potential and challenges of AI, and so they think about how they, the [next generation](#), can respond to the evolving role of AI and society. We want to prepare students for the future workforce."

For the study, researchers developed a computer program called StoryQ that allows students to build their own machine learning models. Then, researchers hosted a teacher workshop about the machine learning curriculum and technology in one-and-a-half hour sessions each week for a month. For teachers who signed up to participate further, researchers did another recap of the curriculum for participating teachers, and worked out logistics.

"We created the StoryQ technology to allow students in high school or undergraduate classrooms to build what we call 'text classification' models," Jiang said. "We wanted to lower the barriers so students can really know what's going on in machine learning, instead of struggling with the coding. So we created StoryQ, a tool that allows students to understand the nuances in building machine learning and text classification models."

A teacher who decided to participate led a journalism class through a 15-day lesson where they used StoryQ to evaluate a series of Yelp reviews about ice cream stores. Students developed models to predict if

reviews were "positive" or "negative" based on the language.

"The teacher saw the relevance of the program to journalism," Jiang said. "This was a very diverse class with many students who are underrepresented in STEM and in computing. Overall, we found students enjoyed the lessons a lot, and had great discussions about the use and mechanism of machine learning."

Researchers saw that students made hypotheses about specific words in the Yelp reviews, which they thought would predict if a review would be positive, or negative. For example, they expected reviews containing the word "like" to be positive. Then, the [teacher](#) guided the students to analyze whether their models correctly classified reviews. For example, a student who used the word "like" to predict reviews found that more than half of reviews containing the word were actually negative. Then, researchers said students used trial and error to try to improve the accuracy of their models.

"Students learned how these models make decisions, and the role that humans can play in creating these technologies, and the kind of perspectives that can be brought in when they create AI [technology](#)," Jiang said.

From their discussions, researchers found that students had mixed reactions to AI technologies. Students were deeply concerned, for example, about the potential to use AI to automate processes for selecting students or candidates for opportunities like scholarships or programs.

For future classes, researchers created a shorter five-hour program. They've launched the program in two high schools in North Carolina, as well as schools in Georgia, Maryland and Massachusetts. In the next phase of their research, they are looking to study how teachers across

disciplines collaborate to launch an AI-focused program and create a community of AI learning.

"We want to expand the implementation in North Carolina," Jiang said. "If there are any schools interested, we are always ready to bring this program to a school. Since we know teachers are super busy, we're offering a shorter professional development course, and we also provide a stipend for teachers. We will go into the classroom to teach if needed, or demonstrate how we would teach the curriculum so teachers can replicate, adapt, and revise it. We will support teachers in all the ways we can."

Study co-authors included Hengtao Tang, Cansu Tatar, Carolyn P. Rosé and Jie Chao.

More information: Shiyan Jiang et al, High school students' data modeling practices and processes: From modeling unstructured data to evaluating automated decisions, *Learning, Media and Technology* (2023). [DOI: 10.1080/17439884.2023.2189735](https://doi.org/10.1080/17439884.2023.2189735)

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